

## FRB:Speech, Bernanke--The Legacy of Milton and Rose Friedman--October 24, 2003

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It is an honor and a pleasure to have this opportunity, on the anniversary of Milton and Rose Friedman's popular classic, *Free to Choose*, to speak on Milton Friedman's monetary framework and his contributions to the theory and practice of monetary policy. About a year ago, I also had the honor, at a conference at the University of Chicago in honor of Milton's ninetieth birthday, to discuss the contribution of Friedman's classic work with Anna Schwartz, *A Monetary History of the United States* (Bernanke, 2002). I mention this earlier talk not only to indicate that I am ready and willing to praise Friedman's contributions wherever and whenever anyone will give me a venue, but also because of the critical influence of *A Monetary History* on both Friedman's own thought and on the views of a generation of monetary policymakers.

In their *Monetary History*, Friedman and Schwartz reviewed nearly a century of American monetary experience in painstaking detail, providing an historical analysis that demonstrated the importance of monetary forces in the economy far more convincingly than any purely theoretical or even econometric analysis could ever do. Friedman's close attention to the lessons of history for economic policy is an aspect of his approach to economics that I greatly admire. Milton has never been a big fan of government licensing of professionals, but maybe he would make an exception in the case of monetary policymakers. With an appropriately designed licensing examination, focused heavily on the fine details of the *Monetary History*, perhaps we could ensure that policymakers had at least some of the appreciation of the lessons of history that always informed Milton Friedman's views on monetary policy.

Today I will pass over Friedman's contributions to our knowledge of monetary history and focus instead on how his ideas have influenced our understanding both of how monetary policy works and how it should be used. That is, I will discuss both the *positive* and the *normative* implications of Friedman's thought. The usual disclaimer applies, that is, I speak for myself and not necessarily for my colleagues at the Federal Reserve.

In preparing this talk, I encountered the following problem. Friedman's monetary framework has been so influential that, in its broad outlines at least, it has nearly become identical with modern monetary theory and practice. I am reminded of the student first exposed to Shakespeare who complained to the professor: "I don't see what's so great about him. He was hardly original at all. All he did was string together a bunch of well-known quotations." The same issue arises when one assesses Friedman's contributions. His thinking has so permeated modern macroeconomics that the worst pitfall in reading him today is to fail to appreciate the originality and even revolutionary character of his ideas, in relation to the dominant views at the time that he formulated them.

To illustrate, I begin with the descriptive or positive side of Friedman's work on monetary policy. Here is a short summary of Friedman's own list of eleven key monetarist propositions, as put forth in the conclusion to his 1970 (note well that date) lecture, "The Counter-Revolution in Monetary Theory." These propositions are a reasonable description, I believe, of Friedman's basic views on how money affects the economy. Here they are (in my summary of slightly more detailed language in the original):

1. There is a consistent though not precise relationship between the rate of growth of money and the rate of growth of nominal income.
2. That relationship is not obvious, however, because there is a lag between money growth and nominal income growth, a lag that itself can be variable.
3. On average, however, the lag between money growth and nominal income growth is six to nine

months.

4. The change in the rate of nominal income growth shows up first in output and hardly at all in prices.
5. However, with a further lag of six to nine months, the effects of money growth show up in prices.
6. Again, the empirical relationship is far from perfect.
7. Although money growth can affect output in the short run, in the long run output is determined strictly by real factors, such as enterprise and thrift.
8. Inflation is always a monetary phenomenon, in the sense that it can be produced only by money growth more rapid than output. However, there are many possible sources of money growth.
9. The inflationary impact of government spending depends on its financing.
10. Monetary expansion works by affecting prices of all assets, not just the short-term interest rate.
11. Monetary ease lowers interest rates in the short run but raises them in the long run.

Let me emphasize again that these propositions reflected Friedman's view as of some thirty-five years ago. At the time, they were far from being the conventional wisdom, as suggested by the term "Counter-Revolution" in the essay's title. What do we make of these propositions today?

First, the empirical description of the dynamic effects of money on the economy given in the first six propositions would be viewed by most policymakers and economists today as being, as the British would put it, "spot on." As a minor illustration of this point, in my own academic research I contributed to a large modern econometric literature that has used vector autoregression and other types of time series models to try to quantify how monetary policy affects the economy. The economic dynamics estimated by these methods correspond very closely to those outlined in Friedman's propositions.

These methods confirm that a monetary expansion (for example) leads with a lag of one to two quarters to an increase in nominal income. Perhaps more importantly, as Friedman emphasized, the responses of the quantity and price components of nominal income have distinctly different timing. In particular, as Friedman told us, a monetary expansion has its more immediate effects on real variables such as output, consumption, and investment, with the bulk of these effects occurring over two to three quarters. (I was going to say, as Friedman *first* told us, but perhaps the credit for that should go to David Hume. Milton's work is, after all, part of a long and great tradition of classical monetary analysis.) These real effects tend to dissipate over time, however, so that at a horizon of twelve to eighteen months the effects of a monetary expansion or contraction are felt primarily on the rate of inflation. The same patterns have been found in empirical studies for virtually all countries, not only by vector autoregression analysis but by more structural methods as well. They are reflected in essentially all contemporary econometric models used for forecasting and policy analysis, such as the FRBUS model at the Federal Reserve. The lag between monetary policy changes and the inflation response is the reason that modern inflation-targeting central banks, such as the Bank of England, set a horizon of up to two years for achieving their inflation objectives.

Thus Friedman's description of the economic dynamics set in train by a monetary expansion or contraction, summarized in his first six propositions, has been largely validated by modern research. What about the other propositions? Friedman's seventh point, that money affects real outcomes in the short run but that in the long run output is determined entirely by real factors, such as enterprise and thrift, is of particular importance for both theory and policy. The proposition that money has no real effects in the long run, referred to as the principle of long-run neutrality, is universally accepted today by monetary economists. When Friedman wrote, however, the conventional view held that monetary policy could be used to affect real outcomes--for example, to lower the rate of unemployment--for an indefinite period. The idea that monetary policy had long-run effects--or, in technical language, that the Phillips curve relationship between inflation and unemployment could be exploited in the long run--proved not only wrong but quite harmful. Attempts to exploit the Phillips curve tradeoff, which persisted despite Friedman's warnings in his 1968

presidential address to the American Economic Association, contributed significantly to the Great Inflation of the 1970s--after the Great Depression, the second most serious monetary policy mistake of the twentieth century.

The diagnosis of inflation in Friedman's eighth proposition, also controversial when he wrote, is likewise widely accepted today. Of course, as we all know, Friedman noted the close connection between inflation and money growth, though carefully acknowledging that excessive money growth could have many causes. As Milton and Rose discussed in Chapter 9 of the 1980 edition of *Free to Choose*, popular views in the 1960s and 1970s (and even the views of some Federal Reserve officials) held that inflation could arise from a variety of non-monetary sources, including the power of unions and corporations and the greediness of oil-producing countries. An unfortunate implication of these views, whose deficiencies were revealed by bitter experience under President Nixon, was that wage-price controls and other administrative measures could successfully address inflation. We understand today that the Great Inflation would simply not have been possible without the excessively expansionist monetary policies of the late 1960s and 1970s.

Some of Friedman's descriptive propositions remain the subject of active research. For example, much research has investigated both theoretically and empirically the interactions of fiscal policy, monetary policy, and inflation. Friedman's view that fiscal deficits are inflationary only if they result in money creation, his ninth proposition, remains broadly accepted, but work by scholars such as Thomas Sargent, Neil Wallace, and Michael Woodford has shown that these links can be subtle. For example, Sargent and Wallace's "unpleasant monetarist arithmetic" suggested that a near-term tightening of monetary policy, by making the long-term fiscal situation less tenable, could (in principle at least) lead to inflation, because the public will anticipate that the fiscal deficit must be financed eventually by money creation. More recently, Woodford's fiscal theory of the price level suggests that nonsustainable fiscal policies can drive inflation, even if the central bank resists monetization. Following Woodford, Olivier Blanchard has recently argued that tight money policies in Brazil, by raising the government's financing costs and thus worsening the fiscal situation, might have had inflationary consequences. Although this subsequent work has refined our understanding of the relationship between monetary and fiscal policy, these analyses are not inconsistent with the spirit of monetarist propositions, which place the blame for inflation on overissuance of nominal government liabilities.

Another area of pressing current interest derives from Friedman's tenth proposition, that monetary policy works by affecting all asset prices, not just the short-term interest rate. This classical monetarist view of the monetary transmission process has become highly relevant in Japan, for example, where the short-term interest rate has reached zero, forcing the Bank of Japan to use so-called quantitative easing methods. The idea behind quantitative easing is that increases in the money stock will raise asset prices and stimulate the economy, even after the point that the short-term nominal interest rate has reached zero. There is some evidence that quantitative easing has beneficial effects (including evidence drawn from the Great Depression by Chris Hanes and others), but the magnitude of these effects remains an open and hotly debated question.

The only aspect of Friedman's 1970 framework that does not fit entirely with the current conventional wisdom is the monetarists' use of money growth as the primary indicator or measure of the stance of monetary policy. Clearly, monetary policy works in the first instance by affecting the supply of bank reserves and the monetary base. However, in the financially complex world we live in, money growth rates can be substantially affected by a range of factors unrelated to monetary policy *per se*, including such things as mortgage refinancing activity (in the short run) and the pace of financial innovation (in the long run). Hence, it would not be safe to conclude (for example) that the recent decline in M2 is indicative of a tight-money policy by the Fed.

The imperfect reliability of money growth as an indicator of monetary policy is unfortunate, because we don't really have anything satisfactory to replace it. As emphasized by Friedman (in his eleventh proposition) and by Allan Meltzer, nominal interest rates are not good indicators of the stance of policy, as a high nominal interest rate can indicate either monetary tightness or ease, depending on the state of inflation expectations. Indeed, confusing low nominal interest rates with monetary ease was the source of major problems in the 1930s, and it has perhaps been a problem in Japan in recent years as well. The real short-term interest rate, another candidate measure of policy stance, is also imperfect, because it mixes monetary and real influences, such as the rate of productivity growth. In addition, the value of specific policy indicators can be affected by the nature of the operating regime employed by the central bank, as shown for example in empirical work of mine with Ilian Mihov.

The absence of a clear and straightforward measure of monetary ease or tightness is a major problem in practice. How can we know, for example, whether policy is "neutral" or excessively "activist"? I will return to this issue shortly.

Besides describing the effects of money on the economy, Friedman also made recommendations for monetary policy--the normative part of his framework. I will discuss just three of the most important of these.

First, Friedman has emphasized the Hippocratic principle for monetary policy: "First, do no harm." Chapter 9 of *Free to Choose* contains a famous quote of John Stuart Mill, as follows: "Like many other kinds of machinery, (money) only exerts a distinct and independent influence of its own when it gets out of order." On this quote, Milton and Rose commented: "Perfectly true, as a description of the role of money, provided we recognize that society possesses hardly any other contrivance that can do more damage when it gets out of order."

Friedman's emphasis on avoiding monetary disruptions arose, like many of his other ideas, from his study of U.S. monetary history. He had observed that, in many episodes, the actions of the monetary authorities, despite possibly good intentions, actively destabilized the economy. The leading case, of course, was the Great Depression, or as Friedman and Schwartz called it, the Great Contraction, in which the Fed's tightening in the late 1920s and (most importantly) its failure to prevent the bank failures of the early 1930s were a major cause of the massive decline in money, prices, and output. It is likely that Friedman's study of the Depression led him to look for means, such as his proposal for constant money growth, to ensure that the monetary machine did not get out of order. I hope, though of course I cannot be certain, that two decades of relative monetary stability have not led contemporary central bankers to forget the basic Hippocratic principle.

A second normative recommendation, worth recalling here, was Friedman's preference for floating rather than fixed exchange rates. At times, at least in popular writing, Friedman rationalized this position as following from free market principles. This argument is a bit disingenuous, I think, as a fixed nominal exchange rate is just one method of anchoring the aggregate price level and is perfectly consistent with free adjustment of the relative prices of goods and services. In a more serious vein, Friedman understood that, in a world in which monetary policymakers put domestic economic stability above balance of payments considerations, a fixed exchange rate system is likely to be unstable during periods of economic stress. He saw that this was the case during the 1930s, when the world was on a modified gold standard called the gold exchange standard, and it was likewise the case under the postwar Bretton Woods system. To reconcile a fixed exchange rate and an emphasis on domestic stability, policymakers must impose capital controls or restrictions on trade, which have undesirable effects on economic efficiency.

If policymakers' first priority is stability of the domestic economy, Friedman reasoned, then why not adopt a

system--namely, flexible exchange rates--that provides the necessary monetary independence without restrictions on the flow of capital or goods? When Friedman wrote about fixed and flexible exchange rates, a switch from the Bretton Woods fixed-exchange-rate system to a floating-rate system seemed quite unlikely. In this, as in many other matters, he was prescient, as the major currencies have now been successfully floating since the breakup of the Bretton Woods system in the early 1970s.

These two recommendations have had major effects on institutional design and policy practice. However, in my view, the most fundamental policy recommendation put forth by Milton Friedman is the injunction to policymakers to provide a stable monetary background for the economy. I take this to be a stronger statement than the Hippocratic injunction to avoid major disasters; rather, there is a positive argument here that monetary stability actively promotes efficiency and growth. (Hence Friedman's suggestion that the long-run Phillips curve, rather than vertical, might be positively sloped.) Also implicit in Friedman's focus on nominal stability is the view that central banks should avoid excessively ambitious attempts to manage the real economy, which in practice may exacerbate both nominal and real volatility. In Friedman's classic 1960 work, *A Program for Monetary Stability*, he suggested that monetary stability might be attained by literally keeping money stable: that is, by fixing the rate of growth of a specific monetary aggregate and forswearing the use of monetary policy to "fine-tune" the economy.

Do contemporary monetary policymakers provide the nominal stability recommended by Friedman? The answer to this question is not entirely straightforward. As I discussed earlier, for reasons of financial innovation and institutional change, the rate of money growth does not seem to be an adequate measure of the stance of monetary policy, and hence a stable monetary background for the economy cannot necessarily be identified with stable money growth. Nor are there other instruments of monetary policy whose behavior can be used unambiguously to judge this issue, as I have already noted. In particular, the fact that the Federal Reserve and other central banks actively manipulate their instrument interest rates is not necessarily inconsistent with their providing a stable monetary background, as that manipulation might be necessary to offset shocks that would otherwise endanger nominal stability.

Ultimately, it appears, one can check to see if an economy has a stable monetary background only by looking at macroeconomic indicators such as nominal GDP growth and inflation. On this criterion it appears that modern central bankers have taken Milton Friedman's advice to heart. Over the past two decades, inflation has fallen sharply and stabilized around the world, not only in the industrialized nations but in emerging-market economies and in even the poorest developing nations. Some central banks, so-called inflation targeters, have set explicit, quantitative targets for inflation; but all central banks, certainly including the Federal Reserve, have emphasized the importance of achieving and maintaining price stability. On the issue of inflation control, Friedman may be judged to have been a bit too pessimistic; his concerns that central banks would have neither the technical ability nor the correct incentives to control inflation led him to recommend his money-growth rule, for which a central bank could certainly be held accountable. Evidently, however, determined central banks can stabilize inflation directly, at least they have been able to do so thus far.

However, on the benefits of monetary stability, or as I would prefer to say, nominal stability, Friedman was not wrong. Many theories popular even today might lead one to conclude that increased stability in inflation could be purchased only at the cost of reduced stability in output and employment. In fact, over the past two decades, increased inflation stability has been associated with marked increases in the stability of output and employment as well, both in the United States and elsewhere.

It has been argued that a lower incidence of exogenous shocks explains these favorable developments, and that may be part of the story. But I believe that there is an important causal relationship as well. For example, low and stable inflation has not only promoted growth and productivity, but it has also reduced

the sensitivity of the economy to shocks. One important mechanism has been the anchoring of inflation expectations. When the public is confident that the central bank will maintain low and stable inflation, shocks such as sharp increases in oil prices or large exchange rate movements tend to have at most transitory price-level effects and do not result in sustained inflationary surges. In contrast, when inflation expectations are poorly anchored, as was the case in the 1970s, shocks of these types can destabilize inflation expectations, increasing the inflationary impact and leading to greater volatility in both inflation and output.

In summary, one can hardly overstate the influence of Friedman's monetary framework on contemporary monetary theory and practice. He identified the key empirical facts and he provided us with broad policy recommendations, notably the emphasis on nominal stability, that have served us well. For these contributions, both policymakers and the public owe Milton Friedman an enormous debt.